

Selection for the post of AME (Group B) in pay band 2 (Rs. 9300-34800 + 4800 GP in Mechanical Department through Departmental selection (70% quota)

Date June 28, 2014

Total Time Permitted: 180 Minutes

Total (Maximum) Marks: 150

Instructions for the Candidates

There are two sections in this question paper – **Section A** and **Section B**.

Section A

- (1) The section has 40 nos. of Multiple Choice (Objective) Type questions. All questions are compulsory and carry 2 marks each.
- (2) There is only one correct answer for each question. If more than one answer is indicated by candidate for a question, no (i.e. zero) marks would be awarded. There is, however, no negative marking for wrong answers.

Section B

This section has Descriptive Type questions.

There are a total of 8 questions. The candidate has to attempt any five (5) questions.

Each attempted question carries 14 marks.

If there are any sub-sections of a question, the break-up of marks is indicated against each sub-section. If no break-up of marks is indicated against the sub-sections of a question, it means that all sub-section carry equal marks.

SECTION A

1. The Honorary Secretary of ICF Staff Council is the:
 - (a) Chief Mechanical Engineer
 - (b) Chief Personnel Officer
 - (c) Dy. CPO-I
 - (d) Dy. CPO-II
 - (e) None of above

2. The 1400 HP DEMUs (Diesel Electrical Multiple Units) being manufactured at ICF are equipped with:
 - (a) AC – AC Transmission
 - (b) AC – DC Transmission
 - (c) Voith Hydraulic Transmission
 - (d) ZF Hydraulic Transmission
 - (e) Mechanical Gear & Pinion based Transmission

3. The material used for fabrication of Side Walls of the LHB Coaches is:
 - (a) Grade 301 Austenitic Stainless Steel
 - (b) Grade 409M Ferritic Stainless Steel
 - (c) Silico-Manganese Spring Steel
 - (d) Corten Steel
 - (e) None of the Above

4. The name of the present General Manager of ICF is:
 - (a) Abhay Kumar Khanna
 - (b) Ashish Kumar Agarwal
 - (c) Shri M.S. Jayanth
 - (d) Shri Rakesh Misra
 - (e) None of the Above

5. Ever since the production year 2013-14, ICF has been regularly turning out HS-SPART which have 3 coach formations comprising of one Tool Van (Driving Car), Medical Van with Air-conditioned Operation Theater (Trailing Car) and a Supervisory Van (Driving Car). In view of Driving Car at either of the ends, there is no need to attach a locomotive to the formation when it is called in case of accidents on the zonal railways.

The phrase SPART here stands for:

- (a) Several Purpose Accident Relief Train
- (b) Special Purpose Accident Relief Train
- (c) Self-Propelled Accident Relief Train
- (d) Special Purpose Accident Relief Train
- (e) Semi-Propelled Accident Relief Train

6. ICF manufactured its first 1600 HP 3-Phase IGBT based DEMU on April 1, 2013 in a 10-car formation with stainless steel body coaches. The shell structure for the coaches was on LHB Platform.

The term IGBT here stands for:

- (a) Isolated Gate Bipolar Transmission
- (b) Insulated Gate Bipolar Transistor
- (c) Isolated Gate Bipolar Transistor
- (d) Isolated Gate Bessemer Transmission
- (e) Insulated Gate Bimetallic Transistor

7. During the Production Meeting held recently on Friday, the CWE Furnishing indicated that WGSCZAC coaches have less cycle time of manufacture and thus easier to turn out in short time available before the month end, when compared to the other AC coaches.

The code WGSCZ here stands for:

- (a) Conventional Composite AC Coach
- (b) Jan Shatabadi AC Chair Car Coach
- (c) Conventional AC-3 Tier Sleeper Coach
- (d) Conventional AC Chair Car Coach
- (e) Shatabadi AC Chair Car Coach

8. Please give the name of Union Railway Minister sworn in in the cabinet of new Prime Minister Shri Narendra Modi.

- (a) Shri Dinesh Trivedi
- (b) Shri Ananth Kumar**
- (c) Shri DV Sadanand Gowda
- (d) Shri Ramvilas Paswan
- (e) Shri Mallikarjun Kharge

9. During his visit to the newly constructed FIAT Bogie Shop in the LHB Shed of ICF on January 8, 2014, the Member Mechanical Railway Board took a keen interest in the Bogie Frame Machining Facility imported from Europe through RITES.

The facility is popularly called:

- (a) 3-Axis Machining Center
- (b) 5-Axis Machining Center
- (c) 7-Axis Machining Center
- (d) Random Axis Robotic Milling Center
- (e) None of the Above

10. The new LHB Shed being constructed near Furnishing Unit of ICF has a projected capacity of:

- (1) 250 LHB Coaches
- (2) 300 LHB Coaches
- (3) 350 LHB Coaches
- (4) 400 LHB Coaches
- (5) 500 LHB Coaches

11. The Shell Body of Kolkata Metro Railway Coaches made at ICF in 2010-2013 period is made of:

- (a) 2 mm thick Stainless Sheet
- (b) 2.5 mm thick Stainless Sheet
- (c) 2.5 mm thick Corten Steel Sheet
- (d) 3 mm thick Corten Steel Sheet
- (e) None of the above

12. The EMU Coaches being made at ICF for MUTP Phase II (Two) Project of MRVC are:
(indicate the wrong answer out of given choices):

- (a) meant for Western Railway and Central Railway
- (b) with 3-Phase IGBT based transmission from M/s Siemens
- (c) with Stainless Steel Shells
- (d) equipped with EP Brakes
- (e) to be turned out in 12-car rakes each with 4 motor coaches

13. ICF manufactured 25 LHB coaches in the year 2013-14. The FIAT bogies equipped in these 25 LHB Coaches had suspension arrangement fitted with :

- (a) Gas Filled Springs
- (b) Steel Helical Springs
- (c) Air/Pneumatic Springs
- (d) Conical Rubber Springs
- (e) None of above

14. For the conventional ICF Coaches, following type of wheels are presently being used on the bogies:

- (a) Only Tyred Wheels
- (b) Only Forged Wheels
- (c) Only Rolled Wheels
- (d) Only Cast Wheels
- (e) Either Forged or Cast Wheels

15. In the year 2003, the Ministry of Railways decided on formation of 7 additional zones. Thus the total number of zonal railways now stood at 16 as against only 9 numbers prior to this. Please point out the answer which is NOT a railway zone on Indian Railways:

- (a) North Central Railway
- (b) West Central Railway
- (c) West Coast Railway
- (d) South East Central Railway
- (e) East Central Railway

16. Bhopal Coach Workshop was formed by Indian Railway to undertake MLR (Mid Life Rehabilitation) of passenger coaches. Before this, there was no workshop to carry out this activity exclusively. The Bhopal Workshop is situated in the following zonal railway:

- (a) Central Railway
- (b) North Central Railway
- (c) West Central Railway
- (d) East Central Railway
- (e) North Western Railway

17. The Project of Rail Coach Factory, Rae Bareilly in the state of Uttar Pradesh was sanctioned under Supplementary Demand for Grants for Railways in 2006. Initially envisaged as JV, it is now a wholly Departmental Unit. The foundation stone was laid on 13th February, 2007 but the construction work could only start in mid-2010. After this, the pace picked up with First Phase of Production starting in April, 2011. As on date, the following type of coaches are being turned out from the Rae Bareilly facility:

- (a) Conventional Main Line non-AC and AC Coaches
- (b) Conventional Self-Propelled (EMU & DEMU) Coaches
- (c) Conventional Main Line & Conventional EOG Coaches
- (d) Both LHB EOG and Conventional Coaches
- (e) Only LHB EOG Coaches

18. Though very small size and weight, the roller bearing is the most critical part of wheel set assembly. A lot of care is required to be taken to ensure its trouble free working on the run as any small failure on this assembly could result in hot axle and be catastrophic for the passenger carrying coach running at excess of 100 kmph speed.

At present, the axle roller bearing fitted on the wheel set of coaches is being sourced from following vendors:

- (1) Only M/s N.E.I. Jaipur
- (2) Only M/s FAG (India) Ltd. Vadodara
- (3) Only M/s Tata Timken Ltd., Jamshedpur
- (4) Only M/s N.E.I. and FAG
- (5) From All Three Vendors

19. With the introduction of LHB Coaches fitted with FIAT Bogies on the Indian Railways, the speed potential has increased tremendously. However, with increased speeds, it is important to have a much improved and more reliable braking system to ensure and guarantee passenger safety. Thus, following brake system is being equipped on the LHB coaches.

- (a) Plain Vacuum based Tread Brake System
- (b) Plain Air Brake Tread Brake System
- (c) Disc Brake System
- (d) Regenerative Brakes System
- (e) None of the Above

20. The material used for furnishing the Interior Side Wall Paneling of LHB Coaches built at ICF is with:

- (a) L.P. Sheets
- (b) Poly Carbonate Based mouldings
- (c) FRP Based mouldings
- (d) Stainless Sheets
- (e) Compreg Board Sheets

21. Which of the following statement is TRUE for the Power Cars of the 1400 HP DEMU rakes being turned out of ICF:

- (1) The Diesel Power pack is equipped with 16 cylinder V-type Engine
- (2) There is no need for Turbo Supercharger on the Engine
- (3) The radiator Fan is not needed for Cooling Water System of the Engine
- (4) The DPC is equipped with DC series motors
- (5) The pantograph is operated & driven with the compressed air

22. Which of the Seating arrangement is followed for J&K DEMU coaches?

- (a) Chair Car with cushioned Bucket Seats
- (b) Chair Car with FRP Seats
- (c) Chair Car with Poly Carbonate Seats
- (d) Cushioned Chairs similar to IR DEMUs
- (e) None of Above

23. Which one of the following is NOT a "District Name" in the state of Tamil Nadu:

- (a) Dharmapuri
- (b) Namakkal
- (c) Perambalur
- (d) Udagamandalam
- (e) Theni

24. Name the Governor of Tamil Nadu State:

- (a) H.R. Bhardwaj
- (b) K. Rosaiah
- (c) Sheila Dikshit
- (d) E.S.L. Narasimhan
- (e) Bharat Vir Wanchoo

25. Which of the following officers would be concerned with preventive maintenance of EOT Cranes in the Shell Unit:

- (a) Dy. CME Production
- (b) Dy. CME Shell
- (c) Dy. CME Plant
- (d) Dy. CME QC
- (e) Dy. CME Project

26. Please indicate the total number of elected members of ICF Staff Council:

- (a) Ten
- (b) Eleven
- (c) Twelve
- (d) Thirteen
- (e) None of above

27. Which of the following department, wing or official of ICF is responsible for issue of "Rolling Stock Certificate" for a coach turned out for use of railways:

- (a) Mechanical/Design
- (b) Dy. CME Planning & IE
- (c) Chief Curator
- (d) Mechanical/ QA
- (e) Chief Security Commissioner

28. Which is the main material being used for manufacturing the main body of the Bio-Toilets being fitted on ICF Coaches:

- (a) F.R.P.
- (b) Stainless Steel
- (c) Corten Steel
- (d) Aluminum
- (e) None of above

29. Give the name of Vice President of India:

- (1) Shri Pranav Mukherji
- (2) Shri Rajnath Singh
- (3) Shri M. Hamid Ansari
- (4) Shri Azam Khan
- (5) Smt. Najma Heptullah

30. Which country won the World Cup Soccer (Football) held in South Africa in 2010:

- (a) Brazil
- (b) Netherlands
- (c) Spain
- (d) Germany
- (e) Argentina

31. Which of the following person of Indian Origin has not won a Nobel Prize

- (a) Rabindranath Tagore
- (b) Satyajit Ray
- (c) Mother Theresa
- (d) Chandrasekhara Venkat Raman
- (e) Dr. Hargobind Khorana

32. Name the First President of India:

- (a) Sarvapalli Radhakrishnan
- (b) R. Venkataraman
- (c) Rajendra Prasad
- (d) V.V. Giri
- (e) Zakir Hussain

33. Name the Head of the Department of ICF under whom CMT (Chemist & Metallurgist) functions:

- (a) Secretary to GM
- (b) CME QA
- (c) CDE Mech.
- (d) Chief Curator
- (e) CEGE

34. ICF is the first organization amongst all Government production units to entirely source its electrical energy requirement from a renewable source of energy. Seven wind mills which ICF has put up in the Tirunelveli District of the Tamil Nadu generate enough electricity to meet the entire requirement of ICF. What is the power generating capacity of each of windmill :

- (a) 0.5 MVA
- (b) 1.0 MVA
- (c) 1.5 MVA
- (d) 2.0 MVA
- (e) 2.5 MVA

35. Which of the following is known as "Father of the Railways"?

- (a) Thomas Alva Edison
- (b) Karl Benz
- (c) Alexander Fleming
- (d) George Stephenson
- (e) Micheal Faraday

36. The head of Security Branch i.e. RPF is headed by Chief Security Commissioner at ICF. The posting of CSC on Railways & Production Units is made by Railway Board on guidance of Union Home Ministry. What is the equivalent rank of CSC of Railways in the Civil Administration?

- (a) Brigadier
- (b) Colonel
- (c) General
- (d) I.G.
- (e) D.I.G.

37. Which process generates the power in the conventional steam ships transporting passengers on seas and oceans:

- (a) Internal Combustion Engine
- (b) External Combustion Engine
- (c) Hydraulic Turbine
- (d) Steam Turbine
- (e) Nuclear Fission

38. At which place is the headquarters of North Central Railway located:

- (a) Lucknow
- (b) Jaipur
- (c) Hajipur
- (d) Allahabad
- (e) Jabalpur

39. Please give the name of the capital of the country "Canada":

- (a) Montreal
- (b) Toronto
- (c) Ottawa
- (d) Vancouver
- (e) Birmingham

40. Which one of the following cricketer currently plays for Chennai Super Kings team in IPL tournament:

- (a) Murali Vijay
- (b) Lakshmipathy Balaji
- (c) Dinesh Karthick
- (d) Muthaiah Muralitharan
- (e) Ravichandran Ashwin

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Section B

Attempt any five questions. Each question carries 14 marks. If there are any sub-sections of a question, the break-up of marks is indicated against each sub-section. If no break-up of marks is indicated against the sub-sections of a question, it means that all sub-section carry equal marks.

1 Answer the following :

- a) Define a Jig and Fixture, clearly establishing the difference between the two. How Jigs & Fixtures are useful in a manufacturing shop?
- b) What are advantages of hydraulic or pneumatic clamping devices over manual clamping device? Explain the hydraulic and pneumatic actuating devices with sketch?

2. What do you understand by Dhara 3(3) of Rajbhasha Adhinyam? What are various papers and documents covered under this?

3. What do you understand by Preventive Maintenance? (marks 3)

How Preventive Maintenance is being implemented in respect of Machinery and Plant at ICF? (marks 11)

4. Describe the Group Incentive Scheme being followed at ICF. How the incentive of various groups and plant section is worked out?

5. Describe Material Handling facilities available at ICF. Suggest measures to improve these facilities and overall efficiency.

6. a) What is the difference between Major and Minor penalty? (marks 3)

b) What punishments can be given under Major and Minor penalty? (marks 4)

c) Explain in details the procedure of issuing and finalizing a Major penalty charge sheet. Can Major penalty be converted into minor penalty? (marks 7)

7. a) What is Plan Head 41 and Plan Head 42? (marks 5)

b) Write in details the procedure of procurement of Machinery and Plant, right from the stage of indent to final commissioning. (marks 9)

8. Write short notes on any four of the following:

a) Factory Act

b) Workman's Compensation Act

c) Hours of Employment Regulations

d) Payment of Wages Act

e) August Review